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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/648,768	08/28/2000	Toshiyuki Sudo	2369.12202	5712

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EXAMINER

CHANG, AUDREY Y

ART UNIT	PAPER NUMBER
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2872

DATE MAILED: 01/11/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/648,768

Applicant(s)

SUDO ET AL.

Examiner

Audrey Y. Chang

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 November 2001.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25, 49 and 50 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-25, 49 and 50 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 August 2000 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of claims 1-25 in Paper No. 5 is acknowledged.
2. Claims 26-48 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to nonelected invention groups, there being no allowable generic or linking claim. Election was made **without** traverse in Paper No. 5.
3. This Office Action is also in response to applicant's amendment filed on November 13, 2001, which has been entered as paper number 5.
4. By this amendment, the applicant has amended claim 23, has canceled claims 26-48 and has newly added claims 49-50.
5. Claims 1-25 and 49-50 remain pending in this application.

Drawings

6. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the features recited in claims 23-25 and 49-50 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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8. Claims 11-18, 19-22, 23-25 and 49-50 are rejected under 35 U.S.C. 112, second paragraph,
as being indefinite for failing to particularly point out and distinctly claim the subject matter which
applicant regards as the invention.

Claim 11 recites the phrase "an arbitrary aperture out of the plurality of apertures is selected" that
is indefinite since it is functional without providing the means to carry out the "selection". Claim 11 also
recites the phrase "a dividing aperture" wherein the dividing aperture comprises a plurality of apertures,
wherein the phrase is indefinite since it fails to provide means for carrying out the division of the
aperture.

The phrase "said split aperture" recited in claim 18 is vague and indefinite since it lacks proper
antecedent basis from its based claim.

The phrase "the parallax image" recited in claim 19 is vague and indefinite since it lacks proper
antecedent basis from earlier part of the claim.

Claims 23, 24 and 49 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete
for omitting essential structural cooperative relationships of elements, such omission amounting to a gap
between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative
relationships are: between the imaging means and the image display means.

Claims 12-18, 21-22, 25 and 50 inherit the rejection from their respective based claims.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis
for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in-

(1) an application for patent, published under section 122(b), by another filed in the United States before the
invention by the applicant for patent, except that an international application filed under the treaty defined in
section 351(a) shall have the effect under this subsection of a national application published under section 122(b)

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only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or
(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

10. Claims 19-21 are rejected under 35 U.S.C. 102(e) as being anticipated by Ono (PN. 6,233,003).

Ono teaches a *parallax image input apparatus* that is comprised of an *imaging device* (16), serves as the *imaging means* for imaging an object (1, 2 or 3), an *imaging forming lens* (14) serves as the *imaging optical system* for guiding the light from the object to the imaging device, and a *lens pupil aperture position control means* (15) for spatially and temporally dividing the pupil of the lens into a plurality of areas and controlling the passing of light beam to each area. The apparatus also comprises a *general control unit* (18) for controlling the switching of the pupil aperture position control means and the imaging recording device for effectively recording and inputting the parallax image, (please see Figure 10 columns 11-12). The pupil is divided in horizontal direction. This reference has therefore anticipated the claims.

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claims 1, 2, 3-10, and 11-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Sudo (PN. 5,719,701).

Sudo teaches a *stereoscopic image display device* that is comprised of an *image display device* (30 Figure 11), serves as the *image display means*, for displaying a plurality of *parallax images*, a

projection lens (22) serves as the *display optical system* for guiding the light to an *exit pupil area* (27) of the optical system. The display device also comprises an *exit pupil control means* (23) that both *spatially* and *temporally* divides the exit pupil of the display optical system (located at the exit pupil plane Q_1) at the position of the eye of an observer into a plurality of areas that correspond to the exit pupil areas (27 as shown in Figure 18) and controls the light passes through the control means to each of the exit pupil areas. The display device further comprises a *switching circuit* (29) that controls the switching of the exit pupil control means in synchronization with the parallax images displayed on the display device; (please see Figure 11 and columns 13-14).

This reference has met all the limitations of the claims with the exception that it does not teach explicitly that a plurality of parallax images are perceived by a single eye of an observer. However such feature is either inherently met by the disclosure or an obvious matter of design choice to one skilled in the art since it merely involves changing the size of the transparent region or aperture size of the exit pupil control means for the benefit of controlling the quality of the image being observed by the observer.

With regard to claims 3 and 12, the exit pupil including the exit pupil areas (27) has a diameter greater than two times of the diameter of the eye, (please see Figure 18).

With regard to claims 4 and 13, Sudo does not teach explicitly that the size of the exit pupil area is less than half of the size of the pupil of the observer. However such modification is considered to be obvious matter of design choice to one skilled in the art that mainly involves the choice of the aperture size of the exit pupil control means (23) for the benefit of obtaining desired image quality displayed and observed by the observer.

With regard to claims 5 and 14, this reference also does not teach explicitly that the stereoscopic display device is mounted on the head however head mount stereoscopic display device is very well known in the art to modify it would have been obvious to one skilled in the art for the benefit of providing a different application for the display device. It also has been held that a recitation with respect to the

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manner in which a claimed apparatus intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. Ex parte Madham, 2 USPQ2d 1647 (1987).

With regard to claims 7-10 and 16-18, Sudo teaches that the image display device may be a *liquid crystal display device*, which is a form of spatial light modulator. Sudo also teaches that the exit pupil control means is comprised of a *light valve*, which also is a form of spatial light modulator. Although this reference does not teach explicitly that the spatial light modulator is a self-emissive type or the exit pupil control means may also be comprised of a micro-mirror device however since self-emissive type spatial light modulator and micro-mirror device are both well known in the art and the specification fails to teach the criticality of using these particular elements would overcome any problem in the prior art such modifications are considered to be obvious matter of design choices to one skilled in the art.

13. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Ono (PN. 6,233,003) in view of the patent issued to Sudo.

The parallax image input apparatus taught by Ono as described for claims 19-20 above has met all the limitations of the claim with the exception that this reference does not teach explicitly that the lens pupil aperture position control means comprises a spatial light modulator. However using spatial light modulator as pupil aperture position control means is very well known in the art as demonstrated by the teachings of Sudo wherein an exit pupil control means (23, Figure 11) comprises a light valve is disclosed. Such modification would therefore have been obvious to one skilled in the art for the benefit of providing an alternative means to provide means for controlling of the pupil aperture.

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14. Claims 23-25 and 49-50 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Sudo as applied to claims 1, 2 and 11 above, and further in view of the patent issued to Ono.

The stereoscopic image display taught by Sudo with the details described for claims 1, 2 and 11 above has met all the limitations of the claims. Sudo teaches that the image display device (30) comprises an image producing means (1) including image pickup device for inputting parallax images to the display device, (please see column 13 and Figure 11). This reference however does not teach the details of the image producing means claimed by the applicant. Ono in the same field of endeavor teaches a parallax image input apparatus that is comprised of an imaging device (16), serves as the imaging means for imaging an object (1, 2 or 3), an imaging forming lens (14) serves as the imaging optical system for guiding the light from the object to the imaging device, and a lens pupil aperture position control means (15) for spatially and temporally dividing the pupil of the lens into a plurality of areas and controlling the passing of light beam to each area. The apparatus also comprises a general control unit (18) for controlling the switching of the pupil aperture position control means and the imaging recording device for effectively inputting the parallax image, (please see Figure 10 columns 11-12). It would then have been obvious to one having ordinary skill in the art to apply the teachings of parallax image input apparatus of Ono to the stereoscopic image display device of Sudo for the benefit of providing a stereoscopic image pickup and display device.

15. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Sudo in view of Ono.

Sudo teaches a stereoscopic image display device that is comprised of an image display device (30 Figure 11), serves as the image display means, for displaying a plurality of parallax images, a projection lens (22) serves as the display optical system for guiding the light to an exit pupil area (27) of

the optical system. The display device also comprises *an exit pupil control means* (23) that both *spatially* and *temporally* divides the exit pupil of the display optical system (located at the exit pupil plane Q_1) at the position of the eye of an observer into a plurality of areas that correspond to the exit pupil areas (27 as shown in Figure 18) and controls the light passes through the control means to each of the exit pupil areas. The display device further comprises a switching circuit (29) that controls the switching of the exit pupil control means in synchronization with the parallax images displayed on the display device, (please see Figure 11 and columns 13-14 of Sudo).

Sudo teaches that the image display device (30) comprises an image producing means (1) including image pickup device for inputting parallax images to the display device, (please see column 13 and Figure 11). This reference however does not teach the details of the image producing means claimed by the applicant. Ono in the same field of endeavor teaches a parallax image input apparatus that is comprised of an imaging device (16), serves as the imaging means for imaging an object (1, 2 or 3), an imaging forming lens (14) serves as the imaging optical system for guiding the light from the object to the imaging device, and a lens pupil aperture position control means (15) for spatially and temporally dividing the pupil of the lens into a plurality of areas and controlling the passing of light beam to each area. The apparatus also comprises a general control unit (18) for controlling the switching of the pupil aperture position control means and the imaging recording device for effectively recording and inputting the parallax image, (please see Figure 10 columns 11-12). It would then have been obvious to one having ordinary skill in the art to apply the teachings of parallax image input apparatus of Ono to the stereoscopic image display device of Sudo for the benefit of providing a stereoscopic image pickup and display device.

Double Patenting

16. A rejection based on double patenting of the "same invention" type finds its support in the language of 35 U.S.C. 101 which states that "whoever invents or discovers any new and useful process ... may obtain a patent therefor ..." (Emphasis added). Thus, the term "same invention," in this context, means an invention drawn to identical subject matter. See *Miller v. Eagle Mfg. Co.*, 151 U.S. 186 (1894);

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In re. Ockert, 245 F.2d 467, 114 USPQ 330 (CCPA 1957); and *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970).

A statutory type (35 U.S.C. 101) double patenting rejection can be overcome by canceling or amending the conflicting claims so they are no longer coextensive in scope. The filing of a terminal disclaimer cannot overcome a double patenting rejection based upon 35 U.S.C. 101.

17. Applicant is advised that should claims 23 and 25 be found allowable, claims 24, 49 and 50 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Audrey Y. Chang whose telephone number is 703-305-6208. The examiner can normally be reached on Monday-Friday (8:00-4:30), alternative Mondays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cassandra Spyrou can be reached on 703-308-1637. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

Audrey Y. Chang
Primary Examiner
Art Unit 2872

A. Chang, Ph.D.
January 8, 2002

